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ABSTRACT

The purpose of this study was to give voice to students' perceptions in two science classrooms taught by two white teachers in an urban multicultural middle-level school situated in the American Deep South. Student participants were 35 students of different ethnicities in grades 7 and 8. The theoretical reference used is social contextual, a reference advocated by a growing number of education researchers. Insights emerging from the study are intended to support critical reflection on the part of science teachers practicing in that context and to others who see application in different contexts. It is asserted that students of diverse backgrounds schooling in a context historically associated with racism directed toward African-Americans are sensitive to teacher attitudes and actions that could be interpreted as discriminatory. Implications for science teacher practices and for future research in middle-level contexts are discussed. (Contains 12 references.)
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Student Perceptions of Science Teacher Actions in Two Culturally Diverse Middle-Level Science Classrooms: A Case Study in the American Deep South

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Abstract

The purpose of this study was to give voice to students' perceptions in two science classrooms taught by two White teachers in an urban multicultural middle-level school situated in the American Deep South. The theoretical reference used is social contextual, a reference advocated by a growing number of education researchers. Insights emerging from the study are intended to support critical reflection on the part of the science teachers practicing in that context and to others who see application in different contexts. One assertion made is that students of diverse backgrounds schooling in a context historically associated with racism directed toward African-Americans are sensitive to detect teacher attitudes and actions that could be interpreted as discriminatory, i.e. racist in the students' evaluation. Implications for science teacher practices and for future research in middle-level contexts are discussed.

Introduction

Increasingly, as descriptive studies are reported that suggest that race, culture, gender, ethnicity, and socio-economic level does have instructional consequences (McGinnis, 1993, 1992; Peshkin, 1991) what is additionally becoming recognized by middle-level researchers as imperative to understand is how mainstream and subordinated student groups perceive teacher actions in the classroom--particularly in geographic areas with a history of tensions between persons of different backgrounds.

Guided by theorists in multiple areas (multicultural education, teacher knowledge bases, constructivism, belief systems, and social contextual research) this study sought to give voice to diverse middle-level students (and one White female student teacher) taught by two White teachers in two classrooms in a public school in the American Deep South.

Purpose

The purpose of this study was to provide a narrative description and interpretation of middle-level students' perceptions of the actions resulting from decision-making of there science teachers in two separate urban, multicultural classrooms in the same school.

Theoretical Framework

This research employed a constructivist referent (von Glaserfeld, 1989). Interactions between the teacher and students made up a "consensual domain" (Maturana, 1978) that defined the learning field in which teacher decisions were made, actions were taken, and students' perceptions were formed.

Methods

The research methodologies used in this study were qualitative (Erickson, 1986) and social contextual (Charron, 1991; Ogbu, 1981). Case studies were conducted of the teaching practices of the two participant teachers over the last academic trisemester in their teaching year (McGinnis, 1993, 1992). Extensive interviews of their students (including one White female student teacher) in small focus groups investigated how

the students perceived their teachers' actions. A systematic investigation was conducted of the social contexts that focused on multicultural considerations, i.e. ethnic and racial demographics and historical events (McGinnis, 1994).

Data Sources

Research Site

The research site was a public middle-level school, pseudonymous World Middle-Level School (WMLS), grades 6 to 8 that had increasingly become exceptionally student ethnically diverse over the preceding five years while the teaching faculty had remained predominately White female. Previously, the student population in the school had been majority Euro-American with some African-American representation (95% White, 5% African American) in a predominantly White suburban public school district. The geographical area of the study site was the American Deep South, a region of the United States historically associated with racism directed toward African Americans.

Participants

Participants in this study included two middle-level school science teachers, pseudonymous Mrs. Guide and Mr. Green (seventh grade Life Science and eighth grade Earth Science teachers, respectively) and their students in one public school located in the Southeastern United States. An additional participant was the Mrs. Guide's student teacher, pseudonymous Miss Fields. The two participant teachers were a White female (Mrs. Guide) with nine years teaching experience and a White southern male (Mr. Green) first year teacher. Miss Field was a White southern female.

The thirty-five middle-level student participants were African American, Asian (Chinese, Cambodian, Korean Japanese, Thai, and Vietnamese), Romanian, Hispanic, Middle Eastern, and Euro-Americans. The non-mainstream cultural diversity in the classrooms exceeded 40% in a state which consists primarily of two groups: Euro-American and African-American. Note: Ethnic backgrounds used in this study to identify participants resulted from interviews with the participants in which they described their backgrounds and stated how they preferred to be identified in subsequent reports.

Data Tools

Data for student perceptions of identified teacher actions were obtained through semi-structured audiotaped and transcribed interviews of students conducted in small focus groups at the school setting throughout the study. Areas of discussion included students' perceived instruction of science content on the middle-level and the perceived identification of their diversity by their teachers.

During instruction teacher actions was documented by researcher field notes and an analysis of twelve videotaped science lessons.

Findings

Students in Mrs.Guide's and Mr. Green's science classes were interviewed in small groups throughout the study. Analytic induction and constant comparison research interpretative techniques were used on the diverse students' verbatim reflections to form categories that relate to multicultural considerations (Erikson, 1986; Glaser & Strauss, 1967).

Mrs Guide's Students Perceptions of Her Actions

Mrs Guide's seventh grade students formed opinions on how they prefered to be taught science in a multiethnic classroom. The students' thoughts and feelings are grouped under the analytic categories She Asks Us To Share Our Backgrounds and She Let's Us Work Together.

She Asks Us To Share Our Backgrounds: Students consistently expressed a preference for learning life science in Mrs Guide's seventh grade multiethnic classroom. The principal reason given for that preference was that they believed Mrs Guide encouraged her students to learn about each others' backgrounds, particularly those who came from other countries. One teacher action that Mrs. Guide performed during the first week of each of the academic trisemesters with her students was a sharing of backgrounds activity. Mrs Guide asked her students to individually address the whole class and state which country or part of the United States they were born, something about their customs, and, if they learned science in

another country, how that was conducted. Students who entered the class after the beginning of the academic semester were also asked to engage in this activity as way of an introduction to their classmates. Students of all backgrounds whom were interviewed for this study consistently expressed the belief that Mrs. Guide's insistence that they share their backgrounds at the beginning of the academic year contributed to an increase of their exposure to other ideas on how life science could be taught and how other ethnic groups think. Furthermore, the mainstream White students particularly expressed that through the experience of learning science in a classroom in which the teacher encouraged an acknowledgement of student diversity, they felt that the experience would better prepare them for life in the greater society outside the confines of the school and their community. The middle-level students perceived American society to be multiethnic and they wanted to be prepared to live and work in it. The culturally diverse school was valued because they believed that without the association with students from diverse backgrounds in the school there was the danger of becoming "racist or something" (White male, interview, 4/30). However, by associating with the "Other" and learning something about their culture, that same student expressed, "*you can't be discriminatory.*"

Student Voices:

Episode 1:

Researcher: *The student body is unique here at WMS. I see international flags and many international students in the cafeteria. What do you think about that? Is it good to go to a school like this and have such cultural diversity in your science classroom?*

White male: *Yes. Because you can be together and learn where they came from and what kind of school they came from and what they had to do.*

White female: *And you can learn a foreign language. I have a friend who is trying to teach me*

a little bit of Korean but I do not think I am catching on.

White female: *Plus you are associating with all this people with different backgrounds--different religions. You know, we are going to do that in the real world when you get a job and all. So it just kind of gets you prepared* (interview, 4/30).

Episode 2:

White female: *I have no problem with different nationalities. I think it adds more to class sometimes. Sometimes when a new person comes from a foreign country they tell us about things that Mrs Guide does not know about their native countries.*

White female: *Sometimes it is neat to hear like what other people learn in their science classes and what they learned. Like different countries, the ethnic groups. Sometimes we have discussions and we don't have to raise our hands or anything, just talk. They will just talk about their teachers there and how they taught* (interview, 4/30).

Episode 3:

Vietnamese American female: *[Being in a multicultural environment] changes the perspective of science. Like what they think. A different ethnic group might think something different than Americans, or something like that* (interview, 5/21).

Episode 4:

White male: *I like being in a class with a bunch of different people!* (interview, 5/7).

Episode 5:

Researcher: *When do you get a chance to learn about other cultures in your science class?*

White female: *When you talk with them [students from diverse backgrounds}* (interview, 5/7).

White male: *Working in groups. When you work in groups you get to work with people from other countries...It is better to have groups so that you can learn more about people than working on your own. It is more fun, too* (interview, 5/7)!

She Let's Us Work Together: The analytic category that emerged from the data on how the students perceived Mrs. Guide's use of cooperative learning groups in science instruction was She Let's Us Work Together. Students appreciated the dyads and cooperative groups that Mrs. Guide regularly used in her science teaching because they could "communicate" and "get to know each other" (White female, interview, 5/7). However, students supported Mrs. Guide's belief that she should not use cultural background as the principal factor in determining group membership. When asked if cultural background should be the primary factor in determining group membership to ensure that each group would be diverse, students expressed that the belief that there was no need to place the burden completely on the teacher to mix the groups. The students felt that over time with learning groups regularly formed and used that eventually they would have the opportunity to work with everyone. One student expressed that belief this way:

But I don't know if the teacher should make sure that, you know, there is a Korean person in your group and someone from another country, too. I do not know. Eventually you will get someone (White female, 5/7).

Student Voices:

Episode 1:

White male: *Working in groups. When you work in groups you get to work with people from other countries* (interview, 5/7).

White female: *Yeah, I think it is better to have partners. So you can, you know, ya'll can help each other, and you can even get to know a person--not talking a lot but being with them. Pairs or groups of four are ok* (interview, 5/7).

Episode 2:

White male: *It is better to have groups so that you can learn about people than working on your own. It is more fun, too!* (interview, 5/7).

White female: *You can communicate. But I don't know if the teacher should make sure that, you know, there is a Korean person in your group and someone from another country too. I do not know. Eventually you will get someone. I like working in group because I can talk, not to disturb someone* (interview, 5/7).

Mr. Green's Students Perceptions of Teacher Actions:

Mr Green's eighth grade students formed opinions on how they preferred to be taught science in a multiethnic classroom. The

students' thoughts and feelings are grouped under the analytic category He Places The ESOL Kids Together.

He Places The ESOL Kids Together: Mr. Green's students noticed that he placed his three students in the ESOL program (English for Students of Other Languages) together in the back of the classroom. Another international student who was frequently absent and not in the ESOL program joined them when he was present. Throughout the research period, the ESOL students were never observed to talk with other students in the earth science class. In every cooperative learning group activity Mr. Green used, he allowed these students to make up their own group. Mr. Green informed the researcher that he placed the students in the ESOL program together so that he could better attend to their questions one-on-one when he visited them in the back of the classroom. He also stated that he believed they could learn from each other, since they all were learning science in a second language. Mr. Green's other students noticed the separateness of the students in the ESOL program in the science classroom and formed the belief that those students wanted to stay to themselves and not associate with the other students in the science class. As a result, the students in the ESOL program remained a mystery to them. Mr. Green's students did not perceive that his action to group the students in the ESOL program in the back of the classroom encouraged the separation of those students from their classmates.

Student Voices:

Episode 1:

Researcher: *What do you know about the ESOL students in your science class?*

Thai female: *Those [ESOL] kids stay to themselves. They do not come and talk with us. They basically keep to themselves (5/28).*

Episode 2:

Researcher: *When do you get to know students of another culture in your earth science class--like the Romanian student in the ESOL program? What is his name?*

Half Korean American female: *Romanian?*

Thai female: *You know, the guy in the back of the room* [Mr. Green's science classroom].

Half Korean American female: *I don't know his name* (interview, 5/28).

Episode 3:

Thai student: *I used to be in the ESOL program for one year. I don't associate with those people. I hang around my friends now. I only have a couple of Oriental [sic] friends. The rest are White and some Black* (5/28).

Episode 4:

Researcher: *What part of the world do the four international students who sit together in your earth science class come from?*

African American female: (shrugs her shoulders) *I do not know* (field notes, 3/30).

Mrs. Guide's and Mr. Green's Students Perceptions of Teacher Actions, in General, In World Middle-Level School:

The teaching faculty at WMLS did not reflect the diverse ethnic background of the students. The faculty at WMS was predominately White female. An eighth grade Half Korean female and a Thai female student who discussed the issue, however, made it clear that they did not believe it was necessary to have a faculty that represented

the diversity of cultures represented in the student body. What they stressed, however, that what was necessary was not to allow teachers with a prejudiced attitude be *their* teachers. Students expressed that they wanted science teachers who knew their science content, made science interesting by letting them do laboratory activities instead of forcing them to read out of the book, used alternative assessment (such as oral tests), and valued their diverse backgrounds.

Student Voices:

Episode 1:

Researcher: *I have noticed that students have very diverse backgrounds here at WMLS but that the teachers (White female) do not. Do you care?*

Thai female: *I have never noticed. It would not really matter to me. I think there should be, like, a lot more guy teachers because they are not as hard as woman (sic), [laughs]. I don't know.*

Half Korean American female: *I have no problem with different teachers. I hate attitudes. There is a teacher here who is All-American White. She has a Black student. Contrast with me. I like heavy metal, American stuff. The Black girl is from Africa, likes rap, Malcolm X, that kind of stuff. Well, this lady teacher probably teaches me better than her. You know, teachers will sometimes say, "they are different you know"--I don't like the way the way they are acting, their music, the way they talk. Some teachers treat other students, like different.*

Researcher: How does a teacher treat other students differently that you have seen?

Thai female: *I seen some. I mean you can just kind of tell. There are some teachers but not a lot.*

There are some. You can just tell by the way you are treated, she may have something against you. I have one teacher who treats me differently because of my background, or I think she does (interview, 5/28).

Episode 2:

African American female: *I wish we could have, like, oral tests. I mean that would be so more fair. I mean, everybody would have a fair chance because, I think it would be better. I hate major tests. It is frustrating.*

Romanian male: *Oral tests. Like she said. It is more easier (sic)* (interview, 5/21).

Episode 3:

Thai female: *I expect the teacher, I don't know, know a lot about science. Cause if we ask him a question off the subject he can answer it and it is still science. For example, if we are studying the star we can ask him a question and he can still answer it* (interview, 4/30/92).

Episode 4:

Researcher: *Does the school support you being different?*

Half Korean American female: *Most definitely. I have got to be different. I do not want to be like everyone else.*

Thai female: *Yeah, everyone is friendly and everything....I think the school makes an effort for it to be okay being international. Different foods, had an international dinner thing, international club*
...ESOL (5/28/92).

Mrs. Guide's Student Teacher's Perception of Mrs. Guide's Actions

During the study, Mrs. Guide was the cooperating teacher for a White female student teacher, pseudonymous Miss Fields. Miss Fields observed Mrs. Guide teaching her students science, and toward the end of the academic year, taught them science lessons. Miss Field's thoughts and feelings are grouped under the analytic category She Puts Her Biases Aside.

She Puts Her Biases Aside: Miss Fields described herself as a White southerner who grow up in a White, midde-class suburban neighborhood located in the Deep South. Her memory of the school she attended during her middle-level grades was that it was a "White school." She assumed her student teaching placement in a suburban middle-level school in the Deep South would be the same. When she first visited World Middle School, she was "flabbergasted" when she saw the student diversity and was informed that there were "fifty-five to sixty" countries represented in the student body. She realized that she held perceptions of different groups of people and wondered how she could teach students of so many different ethnic, cultural, soci-economic and religious backgrounds. She observed Mrs. Guide and perceived from her actions that the way to succeed as a teacher of science in a school characterized by extreme diversity was to put her biases aside and "*treat them all with a clean slateto teach each student fairly*" (inteviwe 6/4).

Student teacher voice:

Researcher: *Since you have spent time in this school, what have you learned on how to teach such a diverse group of students from Mrs. Guide?*

Miss Fields: *Basically to teach each student fairly, as equally as you can. I mean you are going to have some preconceived ideas about what these students are like because society puts a stigma on them. That is what I try to do: to separate what I have learned before and treat each student as an individual and go from there. I think Mrs. Guide does that.*

Researcher: *How do you put your biases away?*

Miss Fields: *Its kind of like when you have heard a lot about a certain group or person and then you actually meet them and you see that they are not the way they truly are. So I just tried not to think about what I heard about a certain group or person before. So I tried to start out with a clean slate all the way across.*

Researcher: *Is that how you have seen Mrs. Guide behave?*

Miss Fields: *Oh, I have seen the way she treats all of them. From what I can tell from my observation of her dealings with students, I think she is very good with them. We have so many cultures in our room sometimes it is really hard to communicate with them. So that can get very confusing to you and frustrating.* (interview, 6/4)

Discussion and In Conclusion

Findings indicated that the middle-level students were supportive of teacher actions that encouraged interpersonal connections of students of diverse backgrounds (expressed in the analytic categories, She Asks Us To Share Our Backgrounds and She Lets Us Work Together). Finding also indicated in one case that the middle-level students were not aware of the impact of teacher actions leading to separatism among themselves and attributed the separation to the students affected (He Places The ESOL Kids Together).

During this study a significant national event that impacted discourse, student' perceptions, and behaviors at World Middle School was the widely shown videotaped arrest and beating of Rodney King, a male African American, by Los Angeles police officers. Discussion of racism in the United States and of discrimination directed toward African Americans in particular played a prominent role in the nation's conversation for several months. Many female African American students at WMS who previously had not expressed dissatisfaction with Mrs. Guide's or Miss Fields' teaching actions increasingly asserted their independence in science class (e.g. reading the Autobiography of Malcolm X during lessons) and were disciplined by the teachers. These students reacted by telling the school's administration that they were being discriminated because of their race and charged that Mrs. Guide and Miss Fields, in particular, were racists. Meetings with the African American students and the schools' counselors defused the situation by interpreting the students' perceptions as arising from being threatened by having too many student teachers on their team. The explanation was that they felt abandoned by their regular classroom teachers with whom they felt comfortable. Mrs. Guide looked forward to the upcoming end of the academic year when those female African American students would leave her seventh grade team and move on to an eighth grade team. She did not want to discuss the situation with them, preferring for the school's counselors to handle the matter. Miss Field expressed her perception of how the situation was resolved by Mrs. Guide and the school administration in this manner:

Researcher: *What have you learned from this experience with the African American students?*

Miss Field: *I would not mention it to any new intern who is placed at this school. Because this is an individual thing -- it is not happening all over the school or anything. Maybe these children have a need that I haven't fulfilled in some way. It could be a lot of things. I think with the Rodney King event taking place, they feel very upset about that and what happened and I do not think they understand it totally or the Malcolm X and all that. Feelings are coming out that a bit*

scary. And I wish we could discuss them with them. But for some reason they say it is better to keep, leave it alone instead of bringing up anger or the aggression right now. (interview, 6/4)

An earlier reported analysis of the social contextual data of the research study indicated that extreme cultural diversity was a relatively new phenomenon for the social systems in the state to accommodate (McGinnis, 1994). Traditionally, divisions between Whites and African Americans created a polarized climate in which racism existed throughout the state and was expressed in the school systems. The recent "multiculturalization" of the state's population, particularly the school-aged population, was positively accepted by both the community and the teachers as long as the newcomer's goal was assimilation into the mainstream culture. Tensions existed when ethnic groups remained identifiably different and assertive, as exemplified by African Americans protests in both the community-at-large and in the classrooms after the Rodney King legal decision.

Generally, the analysis of the data revealed that the two teachers in the study believed that their students should be treated the same in the science content classes conducted at the school while acknowledging that they came from different backgrounds in the social sphere of the school (e.g. the after school international club).

Student perceptions of their teachers' actions indicated that they strongly supported teaching practices such as cooperative grouping that enabled them to interact with students of diverse backgrounds. Students also were extremely receptive to opportunities provided by the teachers to share their backgrounds with each other. Students also perceived some teacher actions as being discriminatory (such as disciplining female African American students for reading Afrocentric literature during science lessons) and identified those teachers as being racist.

Educational Significance

The major finding gained from this extended qualitative study was that both mainstream and subordinated groups of middle-level students were actively aware of and supported teacher actions that promoted

cultural pluralism in a social context characterized by historical racism between two groups: Euro-American and African-American. The students in this study were sensitive to certain teacher actions that they perceived indicated that their teachers held beliefs they defined as racist, and they formed negative evaluations of those teachers. The consensual domain of conversation between the students and the teachers in the science classrooms was impacted by larger social contextual factors, such as the Rodney King event that brought to the forefront discussion of racism in the United States.

This study also documents and alerts researchers in middle-level education to the critical need to examine the concept of racism and its impact on the teaching of science to students from diverse backgrounds. Researchers such as Shil (1975), who advocates the conceptual deconstruction of society into the center and the periphery, with the center consisting of the mainstream cultural group that holds the power to control the periphery, or subordinated cultural groups, Yetman (1991) who alerts us to the changing role of the periphery in the United States as it gains a degree of power but is unsure of how to exert it, and Doob (1993) who couches all discussion of race and relations in the concept of power offer much potential insight into how to interpret this educational issue in middle-level education.

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